ourdiu.com | Shared by Md. Ferdous Foysal Hridoy

Daffodil International University

Faculty of Science & Information Technology
Department of Computer Science & Engineering
Mid Examination, Spring 2025
Course Code: CSE427, Course Title: Digital Image Processing
Level: 4 Term: 2 Batch: 59

Time: 01:30 Hrs **Marks: 25**

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.		A security camera captures images of a parking lot, but the raw images have noise, poor contrast, and low resolution. The security team wants to process these images to enhance visibility, remove noise, and extract important details.		CO1
	a)	Briefly explain the **steps involved in digital image processing** that can be applied to improve the security camera images.	[3]	
	b)	Explain how **image sampling and quantization** affect the clarity of an image.	[3]	
2.		A **traffic monitoring system** is being developed to detect license plates from vehicle images under varying lighting conditions.		CO2
	a)	The plate appears **darker at night** and **brighter in daylight** in the RGB color model. Convert the following **RGB pixel values** from the plate to **HSV format (HSI)** and explain why HSV is better suited for license plate recognition in different lighting conditions. RGB values: • **Daylight condition:** R=200,G=180,B=150 • **Night condition:** R=100,G=90,B=70	[6]	
	b)	<table><tr><td>4</td><td>4</td><td>4</td><td>4</td><td>4</td></tr><tr><td>3</td><td>4</td><td>5</td><td>4</td><td>3</td></tr><tr><td>3</td><td>5</td><td>5</td><td>5</td><td>3</td></tr><tr><td>3</td><td>4</td><td>5</td><td>4</td><td>3</td></tr><tr><td>4</td><td>4</td><td>4</td><td>4</td><td>4</td></tr></table> If the number plate looks like the above image then apply **Histogram Equalization** technique to enhance the contrast of the image and also show the equalized image.	[4]	

ourdiu.com | Shared by Md. Ferdous Foysal Hridoy

3.		A hospital receives low-contrast X-ray images, making it difficult for radiologists to detect fractures clearly. The image looks like:		CO3

115	118	117	116
119	121	120	118
122	125	124	123
127	130	129	128

	a)	The radiologist wants to enhance bone structures while suppressing background noise. Suggest a suitable **spatial filtering technique** and apply the technique on pixel (2,2), (2,3), (3,2) and (3,3) of the above image (You may use 3X3 kernel size filter).	[5]
	b)	Apply **mean filter** on all the pixels of the above image and show the output image.	[4]

ourdiu.com